IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group Art Unit 1742	:	
Examiner J. Roe	:	COBALT-NICKEL-MOLYBDENUM ALLOYS WITH REDUCED LEVEL
In re Application of Forbes Jones et al.	:	OF TITANIUM NITRIDE INCLUSIONS
Serial No. 10/656,918	:	
Filed September 5, 2003	:	Confirmation No. 8375

DECLARATION OF ROBIN M. FORBES JONES, Ph.D.

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

1. I, Robin M. Forbes Jones, declare as follows:

2. I am a citizen of the United States and currently reside at 11700 Gullane Court, Charlotte, North Carolina 28277. I am over the age of eighteen and am competent to makes the statements in this Declaration.

3. I am named as an inventor on the above-identified '918 patent application.

4. In 1964 I received a B.S. degree in Metallurgy from Imperial College, London University. In 1967 I received a Ph.D. degree in Metallurgy, also from Imperial College.

5. For 7 years following my Ph.D., I worked for International Nickel as a research metallurgist and research manager. Throughout this period I was involved in the development of new alloys for a variety of applications. For 13 years I worked in the biomedical industry at the Johnson and Johnson Dental Products Company, and for two years at Dentsply Company as a research manager and research director developing

new products (including alloys) for use in dentistry. For the past 15 years I have worked at Allvac (now ATI Allvac), Monroe, North Carolina, in a number of positions developing alloys and alloy production techniques. I am currently Director, Process Development, at ATI Allvac. In my current position I routinely work with electron beam melting techniques and equipment and numerous other techniques and equipment for melting, refining, and processing nickel base and cobalt base superalloys, titanium alloys, and other alloys.

6. Through my previous and current employment I have gained a substantial background in and understanding of the various techniques and equipment for melting, refining, and processing alloys, including electron beam melting techniques and equipment. Although my experience is broad, I have gained particular experience with the techniques and equipments used in melting, refining, and processing nickel base and cobalt base superalloys (including MP35N alloys) and titanium alloys.

7. I am thoroughly familiar with the alloy described in ASTM specification F 562-02, "Standard Specification for Wrought 35Cobalt-35Nickel-20Chromium-10Molybdenum Alloy for Surgical Implant Applications (UNS R30035)" ("the ASTM Specification"), which is directed to an alloy commonly known as "MP35N" alloy. I also am thoroughly familiar with the conventional manner of melting and processing MP35N alloy for the applications to which the ASTM Specification is directed. I note that MP35N alloy is conventionally made using vacuum induction melting followed by vacuum arc remelting, and that this combined melting technique is at least partially intended to limit segregation-related melt defects within the alloy ingot.

8. I have thoroughly reviewed the article authored by S. Cockcroft et al., entitled "Inclusions and the EB Refining of Superalloys" ("the Cockcroft article"). In general, the Cockcroft article describes electron beam refining of Alloy 718 as a means of reducing the level of certain hard inclusions in the alloy.

9. I understand that the patent examiner in the '918 application concludes that it would have been obvious to one of ordinary skill in metallurgy to process the alloy described in the ASTM Specification using the electron beam melting technique described in the Cockcroft article as a means of eliminating titanium nitride inclusions in the alloy.

10. I disagree that an ordinarily skilled individual would have been motivated to process MP35N alloy by electron beam melting, as described in the Cockcroft article or otherwise. It is well recognized that electron beam melting provides little or no control over solidification of the ingot and typically produces ingots that are chemically inhomogeneous, exhibit substantial microsegregation, and suffer from a substantial level of segregation-related defects, such as freckles and other regions of positive and negative segregation. Microsegregation-related defects such as, for example, freckles, would negatively affect the fatigue resistance and other mechanical properties of the ingot material. An illustration of the foregoing drawback of electron beam melting is illustrated in attached Figure 1, which shows a prepared surface of a superalloy ingot that had been produced by electron beam melting. The ingot material shown in Figure 1 includes very apparent microsegregation-related melt defects in the form of freckles, which are areas of trapped solute-rich material.

11. One of ordinary skill would have readily concluded that processing MP35N alloy by electron beam melting would produce an ingot that is chemically inhomogeneous, suffers from a significant level of microsegregation-related melt defects, and is unacceptable for use in, for example, the surgical implant applications to which the ASTM Specification is directed. Therefore, an ordinarily skilled metallurgist would not have looked or relied upon teachings in the Cockcroft article when considering how to reduce the level of inclusions in, or how to otherwise improve, the alloy described in the ASTM Specification.

12. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or document or any registration resulting therefrom.

Date: Nov 28th 2006

Robin M. Forbes Jones